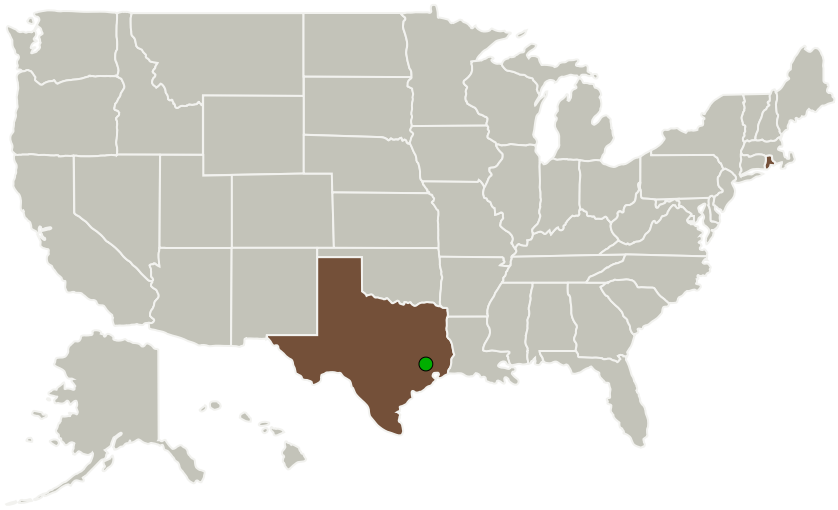
# Hybrid Battery Ultracapacitor System For Human Robotic Systems, Phase I

Completed Technology Project (2011 - 2011)

## Project Introduction

The objective of this proposal is to develop a hybrid battery-ultra capacitor storage system that powers human-robotic systems in space missions. Space missions involving human-robotic systems utilizing battery based electrical power often undergo numerous operations within each complete cycle. During Phase I of this program Yardney in collaboration with Maxwell Technologies propose to develop a hybrid system consisting of a high energy Li-ion battery, high power ultracapacitor (UCAP) and the electronic interface control module. The hybrid system to be developed in this program will provide electrical energy to human-robotic systems for advanced next generation space missions.

## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Yardney Technical Products, Inc. | Lead Organization | Industry | East Greenwich, Rhode Island |
| Johnson Space Center(JSC) | Supporting Organization | NASA Center | Houston, Texas |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| Primary U.S. Work Locations | |
|---|---|
| Rhode Island | Texas |

## Project Transitions

**February 2011:** Project Start

**September 2011:** Closed out

**Closeout Summary:** Hybrid Battery Ultracapacitor System For Human Robotic Systems, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image*(https://techport.nasa.gov/file/138606)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Yardney Technical Products, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

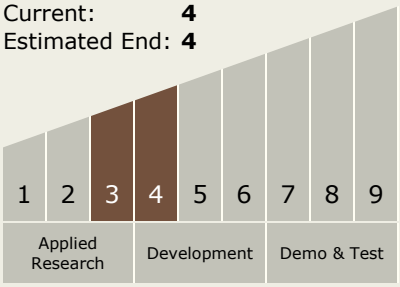
Carlos Torrez

**Principal Investigator:**

Joe Gnanaraj

## Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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## Technology Areas

**Primary:**

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.1 Electrochemical: Batteries

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System